Geophysical Research Abstracts,
Vol. 11, EGU2009-14042, 2009
EGU General Assembly 2009

Influence of policy and climate change on air quality within the UK West Midlands plume

H.L. Walker and J. Baker

University of Birmingham, Division of Environmental Health and Risk Management, School of Geography, Earth and Environmental Sciences, Edgbaston, B15 2TT, UK (j.baker@bham.ac.uk)

The photochemical trajectory model (PTM), coupled with the Master Chemical Mechanism (MCM v3.1), was used to assess the contribution of locally emitted anthropogenic and biogenic emissions to ambient secondary pollutant levels recorded in Birmingham, UK during the summer Pollution in the Urban Midlands Atmosphere (PUMA) campaign (9 June – 12 July 1999). The contribution to ozone (and particulate matter) formation were found to be small, 0.0 to 3.2 ppb (0 to 11 %), with an overall average contribution of about 0.35 ppb or 1.0 % of the total ozone during the period. Subsequently, a stationary or slowly advecting boundary layer scenario was used to assess the timescales for which the local emissions within the West Midlands react and impact on secondary pollutant levels within or downwind of the region. Considering averaged biogenic and anthropogenic emissions across the region as representative of the West Midlands plume, the formation of ozone was found to be VOC-limited, and increased emissions of BVOCs were found to overall increase the reactivity of the plume. Future emissions scenarios were then modelled for 2010, 2015 and 2020 taking into account implementation of European legislation and possible climate change. This work reports on the predicted effects of these policy implementations and possible climate changes have on air quality within and downwind of the West Midlands connurbation.